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Mechanisms of interraction of Helicobacter pylori with epithelium of gastric mucosa. I. Pathogenic factors promoting successful colonization

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Abstract

© Saint Petersburg Pasteur Institute. All rights reserved. H. pylori is a Gram-negative, crimp and motile bacterium that colonizes the hostile microniche of the human stomach roughly one half of the human population. Then persists for the host's entire life, but only causes overt gastric disease in a subset of infected hosts. To the reasons contributing to the development of diseases, usually include: concomitant infections of the gastrointestinal tract, improper sterilization of medical instruments, usually endoscopes, nonobservance of personal hygiene rules, prolonged contact with infected or carriers, including family members and a number of other factors. Clinically, H. pylori plays a causative role in the development of a wide spectrum of diseases including chronic active gastritis, peptic and duodenal ulceration, gastric adenocarcinoma, and gastric mucosa-associated lymphoid tissue lymphoma. Due to the global distribution of H. pylori, we are able to conclude that smart strategies are contributing to adaptation of the bacterium in an aggressive environment of a stomach and lifelong permanent circulation in its host. Thirty-four years after the discovery of this bacterium, there are still many unanswered questions. For example, which strategies help the bacterium to survive in this inhospitable conditions? Understanding the mechanisms governing H. pylori persistence will improve identification of the increased risk of different gastric diseases in persons infected with this bacterium. A well-defined and long-term equilibrium between the human host and H. pylori allows bacterial persistence in the gastric microniche; although this coexistence leads to a high risk of severe diseases the diseases which are listed above. In this review, we discuss the pathogenesis of this bacterium and the mechanisms it uses to promote persistent colonization of the gastric mucosa, with a focus on recent insights into the role of some virulence factors like urease, LPS, outer membrane proteins, cytotoxins, factors, promoting invasion. Information on the mechanisms related to H. pylori persistence can also provide the direction for future research concerning effective therapy and management of gastroduodenal disorders. The topics presented in the current review are important for elucidating the strategies used by H. pylori to help the bacterium persist in relation to the many unfavorable features of living in the gastric microniche.

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Keywords

Colonization mechanisms, Gastric mucosa, Helicobacter pylori, Pathogenesis, Pathogenic factors, Persistence

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